

## Comet Dust Migration in Jupiter's Stratosphere

R.A. West, A.J. Friedson (JPL)

The Shoemaker-Levy 9 impact events in July, 1994 provided a unique opportunity to observe stratospheric processes in the jovian atmosphere. We report on observations of the ultraviolet absorbing haze in the F218W filter (effective wavelength 230 nm) of the Wide Field Camera on the Hubble Space Telescope made over the 3.5-year period after the impacts. The impacting bodies entered Jupiter's atmosphere near latitude -45 degrees. Initial plume fallback and upwelling near the insertion tube emplaced particles high in Jupiter's stratosphere (1 mb to 300 mb) and spread over +/- 10 to 15 degrees in latitude. Eddy motions during the first week after impact swept particles away from the initial position, over a latitude range of about +/- 10 degrees. By August 1994 (one month after impact) some particles reached latitude -25 degrees. Subsequent to that time the particles migrated slowly, consistent with a horizontal eddy diffusion that is latitude-dependent (decreases toward the equator). By November 1997 few if any particles had migrated northward of about -15 degrees latitude. At that same time S-L 9 residual haze was detected between latitude -45 and -15 degrees. Estimates of latitude-dependent eddy diffusion based on the work of West et al. (*Icarus* **100**, 245-259, 1992) are consistent with the observations and dominate particle transport. We were not able to determine particle migration poleward of -45 degrees latitude because of the temporal and spatial variability of the jovian polar haze, a topic of interest in its own right. A more detailed account can be found in Friedson et al., Transport and mixing in Jupiter's stratosphere inferred from comet S-L9 dust migration, submitted, 1998. This work was performed by the Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA

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Paper presented by Robert West

MS 169-237

Jet Propulsion Lab

4800 Oak Grove Dr

Pasadena, CA 9110

Phone: 818 354 047

Fax:

Email: raw@west.jpl

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